



Health Trends™

Drug Misuse in America 2018

Diagnostic Insights from Clinical Drug Monitoring
into the Opioid Epidemic

September 2018



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Drug Misuse in America 2018

Summary

About Drug Monitoring Tests and Drug Misuse

Finding 1: More than half of patients misuse their medications

Finding 2: Misuse of most prescription and illicit drugs declined, but is still prevalent, in general care patients

Finding 3: Drug mixing, a contributing factor to overdose deaths, is the most frequent form of misuse observed in the Quest data, and it shows no signs of abating

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We are pleased to present this year's Quest Diagnostics Health Trends™ report on Drug Misuse in America.

The statistics the Centers for Disease Control and Prevention (CDC) provide about the drug epidemic are bleak. **Drug overdoses killed more than 72,000 Americans in 2017**, a 13 percent increase over the previous year and a two-fold increase over the past decade. The sharpest increase occurred among deaths related to fentanyl and fentanyl analogs (synthetic opioids) with nearly 30,000 overdose deaths.¹

Behind these data is devastation. Drug misuse takes lives, destroys families and affects the fabric of communities. For these reasons, we believe the drug epidemic is one of the most significant and challenging healthcare issues of our time.

In this report, we provide insights into the evolving drug misuse epidemic – insights based on analysis of clinician-ordered drug monitoring performed for patients across the United States by Quest Diagnostics.

Laboratory data is foundational to healthcare. As you will see in this report, it can reveal trends and patterns that prescription, claims and other data cannot, both for the individual and populations. With these insights, patients, healthcare providers and policy makers are empowered to take actions leading to better health.

We hope the present report informs your understanding of the evolving drug epidemic and its impact on the lives of patients, families and the community at large.

Regards,



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Harvey W. Kaufman, M.D.
Senior Medical Director and Director
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Drug Misuse in America 2018, a Quest Diagnostics Health Trends™ report, presents findings from analysis of more than 3.9 million de-identified aggregated clinical drug monitoring tests performed by Quest Diagnostics for patients in all 50 states and D.C. between 2011 and 2017. To our knowledge, this report is the largest of its kind to provide current insights into prescription and illicit drug use and misuse in the United States based on laboratory insights.

In this report, we reveal evolving patterns in drug misuse, specifically:



The rate of drug misuse remained constant, as it has for several years. The misuse rate in 2017 was 52 percent, unchanged from 2016. This suggests improvements in appropriate drug use have plateaued and misuse rates remain at high levels.



Drug mixing, a contributing factor to overdose deaths, **is the most frequent form of misuse observed in the Quest data**, and it shows no signs of abating. The highly dangerous combination of opioids and benzodiazepines is frequently found in patients tested in primary care and pain management settings.



Despite the unchanged rate, **the nature of the drug misuse epidemic is shifting**. Misuse of some drugs shows signs of decline in certain populations, but explosive growth in others. Non-prescribed fentanyl and heroin are particular threats.



Gabapentin has emerged as a potential concern, with dramatic increases in misuse observed in just one year.

For clinicians, drug monitoring can provide insights into possible forms of misuse including: substance use disorders, dangerous drug combinations, incomplete treatment, and/or “diversion” – instances where the prescribed drug is not found in the patient’s specimen, suggesting the patient is possibly filling the prescription but may be diverting the drug to others or opted not to take it.

The intent of this and other Quest Diagnostics Health Trends reports is to provide insights based on objective laboratory data. Please refer to the Methodology on **page 16** for a detailed explanation of our study method and strengths and limitations.

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Laboratory test results provide objective information that can assist healthcare providers to assess patients' use of prescribed medications, other controlled non-prescribed drugs and illicit drugs.

In the case of clinical drug monitoring, a healthcare provider orders drug testing and indicates the drug or drugs prescribed for the patient. Quest Diagnostics categorizes test results as “consistent” or “inconsistent” based on the presence of drugs or drug metabolites identified through laboratory testing and their alignment with the prescription information provided by the healthcare provider.

A consistent result indicates that the prescribed drug or drugs found match those the healthcare provider indicated were prescribed for the patient on the test order.

An inconsistent result – suggesting possible misuse – occurs when:



Additional drugs are found:

all prescribed drugs are detected, but at least one other drug, non-prescribed or illicit, is also detected.



Different drugs are found:





at least one prescribed drug is not detected, and at least one other drug, non-prescribed or illicit, is detected.



No drugs are found:

at least one prescribed drug was not detected, and non-prescribed or illicit drug(s) were also not detected.

Why would a prescribed drug not be found?

-  Patients may not take their prescribed drugs due to concerns of side effects, because their pain or other symptoms have subsided, or to hoard for future pain relief.
-  Some patients may not take their prescribed drugs because they cannot afford them.
-  Some patients sell or give their drugs to others not authorized to use them.
-  A small number of patients may be rapid metabolizers of the prescribed drug and the drug or metabolite is undetectable at the time of testing.

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A **non-prescribed drug** refers to a prescription drug which was not prescribed for the patient as indicated by the healthcare provider on the test order.

Inconsistent results can reflect potential problems for the patient and the healthcare system:

- Drug combining, whether involving prescription or illicit drugs, can lead to dangerous drug interactions.
- Test results that show evidence of a non-prescribed drug likely indicate the patient is using the drug without the benefit of a physician's oversight.
- Failure to take a prescribed drug may contribute to healthcare waste, ineffective treatment and the potential for unintentional or criminal diversion.

For more information about Quest Diagnostics Drug Monitoring for clinicians, visit www.QuestDrugMonitoring.com



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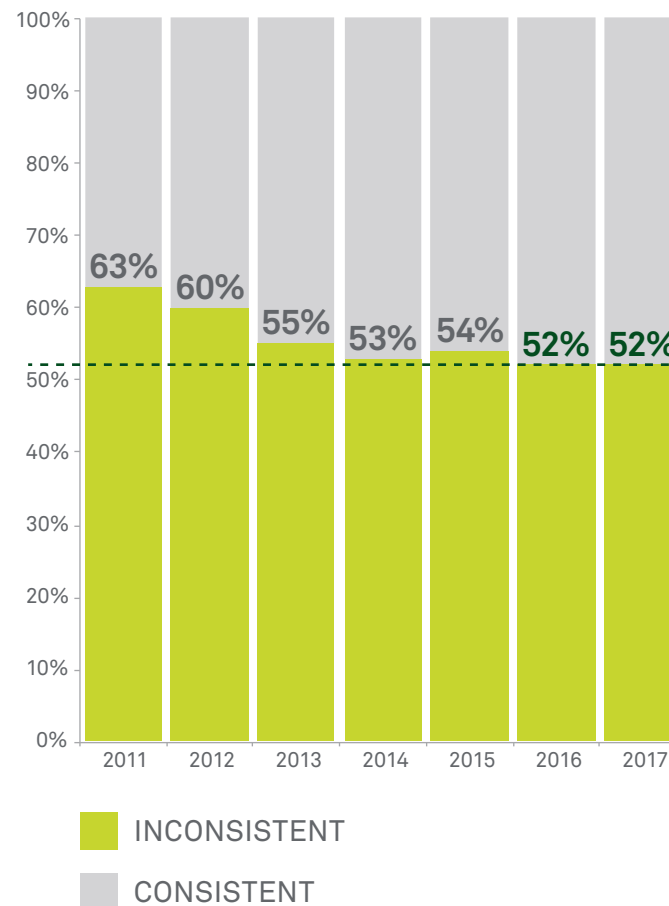
In 2017, **52 percent** of drug monitoring tests performed by Quest showed signs of potential misuse, the same percentage as in 2016. In fact, the rate of prescription misuse has been relatively constant for the past five years, following a dramatic decline in the rate of inconsistent test results from 63 percent in 2011, Quest's first full year of drug monitoring, to 53 percent in 2014.

This suggests improvements in appropriate drug use have plateaued and misuse rates remain at high levels.

Among the 52 percent of specimens that showed evidence of inconsistent results in 2017:

- Forty-five percent were positive for non-prescribed or illicit drugs in addition to all their prescribed drugs, compared to 43 percent in 2016.
- Thirty-four percent did not show all the drugs they had been prescribed, or any other tested drug, the same percentage (34 percent) in 2016.
- Twenty-two percent did not show all the drugs they had been prescribed, but were positive for other illicit or non-prescribed drugs, roughly equivalent to the 23 percent observed last year.

Inconsistency Trends



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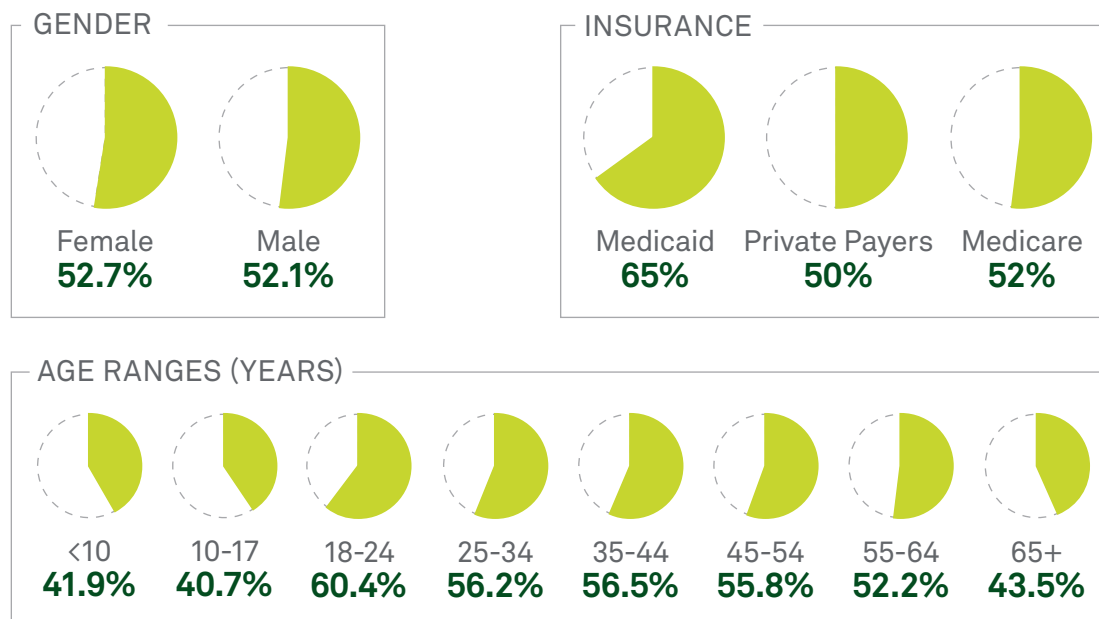
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Prescription drug misuse was not confined to any single patient category; it spanned age groups, health plans and gender. Rates of inconsistency between what was prescribed and what was found were virtually identical for both males (52.1 percent) and females (52.7 percent). All age groups had inconsistency rates between 40 and 60 percent, including less than ten years old and 65 years and older.

While patients in Medicaid were more likely to show signs of misuse, about half or more of those in Medicare or a private health plan also had evidence of misuse upon testing. With drug misuse, **anyone is at risk.**

Inconsistency Rates for Different Patient Categories



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Finding 2: Misuse of most prescription and illicit drugs declined, but is still prevalent, in general care patients

While the total misuse rate remained flat, the Quest analysis points to some good news about the evolving nature of the drug epidemic.

Among patients in general care – that is, receiving care from a primary care clinician or pain specialist – rates of non-prescribed opioid and amphetamine drug use as well as illicit drug use declined between 2016 and 2017.

The general care population comprised approximately 92 percent of the total population to receive drug monitoring from Quest Diagnostics in 2017.

The only medication that saw a marked increase in use in a non-prescribed form in the general care population was gabapentin (see [page 14](#) for more information).

While patients in the general care population were less likely to use many types of non-prescribed prescription drugs or illicit drugs, more than one in three (34.8 percent) used additional or different drugs, approximately equivalent to last year's findings. This indicates that while use of nonprescribed opioids and other medications have declined generally across this population, other forms of potentially dangerous misuse persist.

The declining rates of use of non-prescribed opiates and other medications in general care settings may be due to efforts of the medical community to reduce access to certain prescription drugs – namely opioids. In 2017, U.S. prescription opioid volume declined 12 percent, the largest drop in 25 years. These declines are the result of several developments, including clinical care shifts, payer reimbursement controls, and regulatory and legislative restrictions.² Although these trends suggest that patients may be less likely to use non-prescribed or illicit drugs, misuse remains prevalent.

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Patients in substance use treatment at increasing risk

The Quest data paints a stark image of the challenges of caring for patients in treatment for substance use disorders. Among patients tested in treatment centers for substance use disorders (SUD), the rate of use of non-prescribed drugs and illicit drugs surged, in some cases dramatically, across almost all drug classes.

Most notably, the **rates of non-prescribed fentanyl and heroin use in the SUD center population increased nearly 400 percent in the past year.** In 2017, more than 27 percent of all specimens tested from this population demonstrated misuse of non-prescribed fentanyl. Nearly 10 percent revealed heroin use.

Increases in non-prescribed fentanyl were especially pronounced among younger patients (ages 18-44 years) in SUD centers, increasing from 3.4 percent in 2016 to over 29 percent in 2017. The rate of heroin positivity also surged in this population, from 0.8 percent in 2016 to 9.9 percent in 2017.

The findings are striking in light of other research that suggests young adults are at increasing risk for opioid-related deaths. In 2016, 20 percent of adults who died from an opioid-related overdose were 24-35 years of age, up from 4 percent in 2001.³

One in seven people in the United States is expected to develop a substance use disorder at some point, but only one in 10 will receive treatment.⁴

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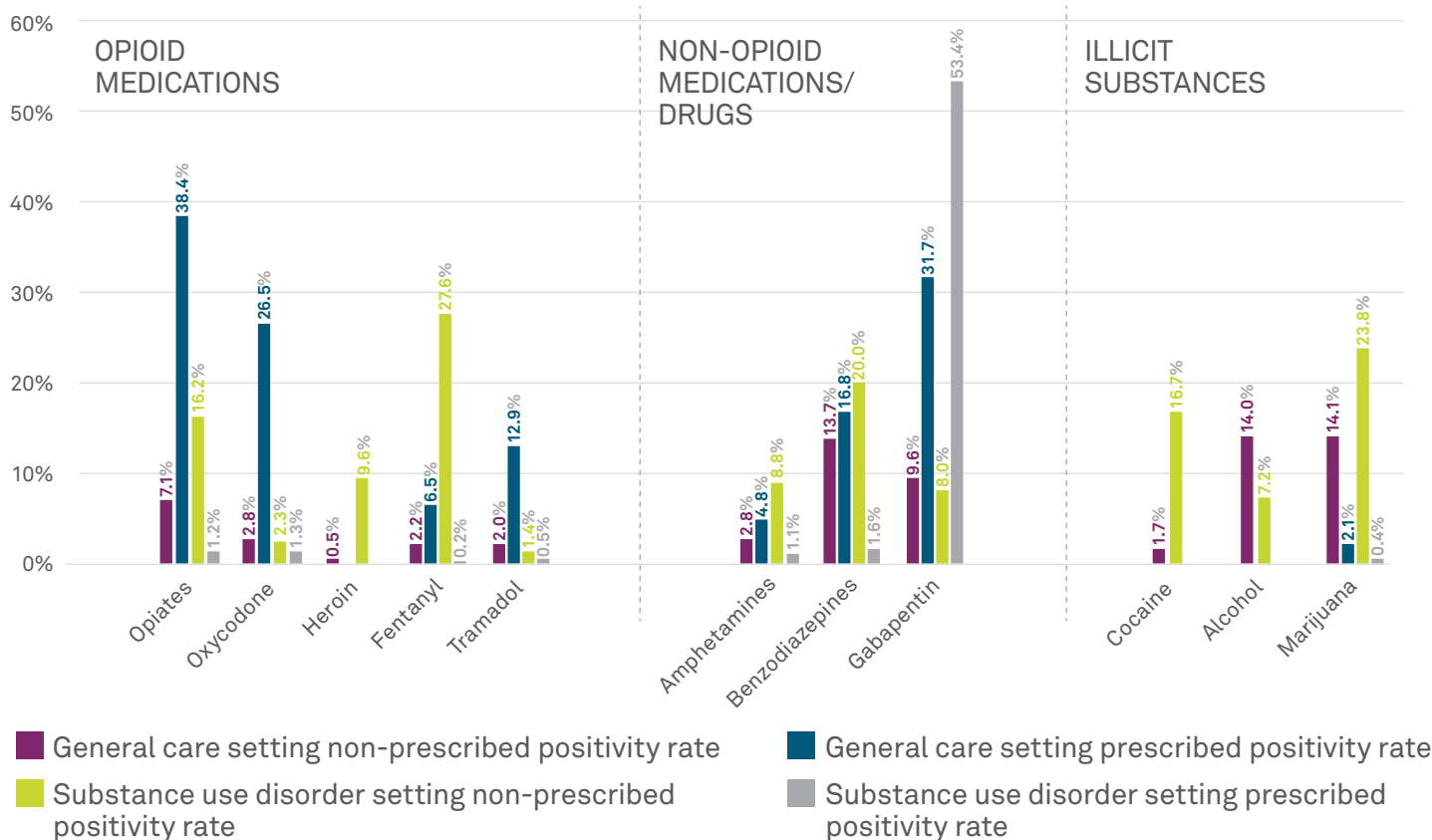
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The Quest data also suggests that the use of medical marijuana has increased in both the general and substance use disorder treatment populations. This is perhaps unsurprising as clinicians seek alternatives to prescription opioids to care for patients in pain.

For patients in general care, the rate of non-prescribed amphetamine use decreased, while the rate of non-prescribed use of amphetamines increased in patients in SUD centers. In both populations, use of cocaine declined.

medMATCH® Drug Class Positivity Rates for All Types



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Finding 3: Drug mixing, a contributing factor to overdose deaths, is the most frequent form of misuse observed in the Quest data, and it shows no signs of abating

According to the CDC, most drug-related deaths involve drug combinations. The Quest analysis found the most common form of drug misuse observed in its data involved potentially dangerous drug combining.

In 2017, 45 percent of patients whose tests results showed signs of misuse had evidence of combining their prescribed drug/s with one or more other drugs, including illicit.

Among these, two types of drug combinations stood out: fentanyl and heroin, and benzodiazepines and opioids.



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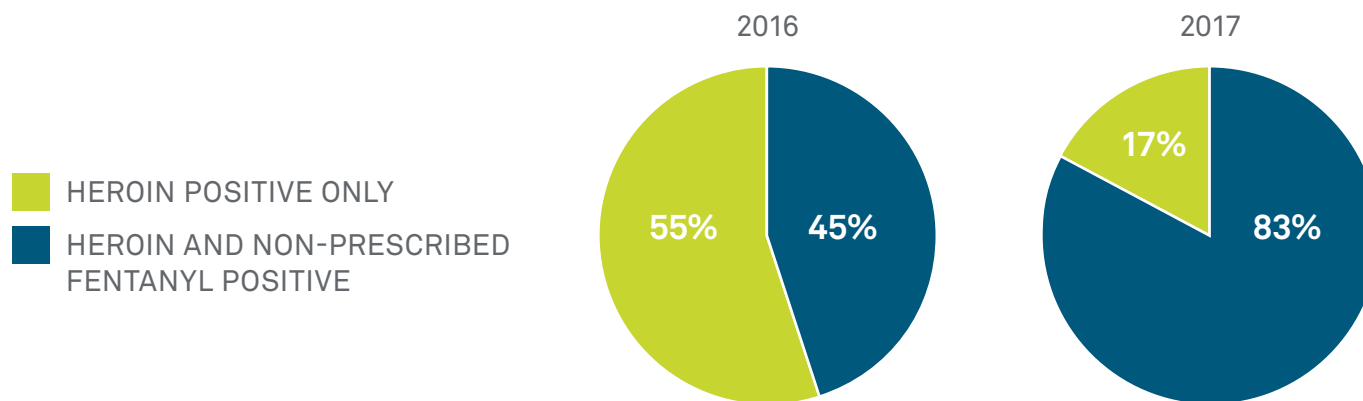
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Fentanyl and Heroin

Mixing of heroin and fentanyl is on the rise. Among specimens positive for heroin, and tested for both drugs, **83 percent were also positive for non-prescribed fentanyl**. This rate is almost double the rate found in 2016 (45 percent). Because drug monitoring does not detect synthetic (illicit) forms of fentanyl, these rates may be even higher.

Fentanyl, a synthetic opioid that is 50 to 100 times more potent than morphine, is often mixed with heroin to increase drug effects.⁵ This drug combination is especially dangerous due to the high potency of fentanyl, meaning even a very small quantity has a very powerful effect on depressing respiration.

Mix of Heroin and Non-prescribed Fentanyl in Specimens Positive for Heroin



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Opioids and Benzodiazepines

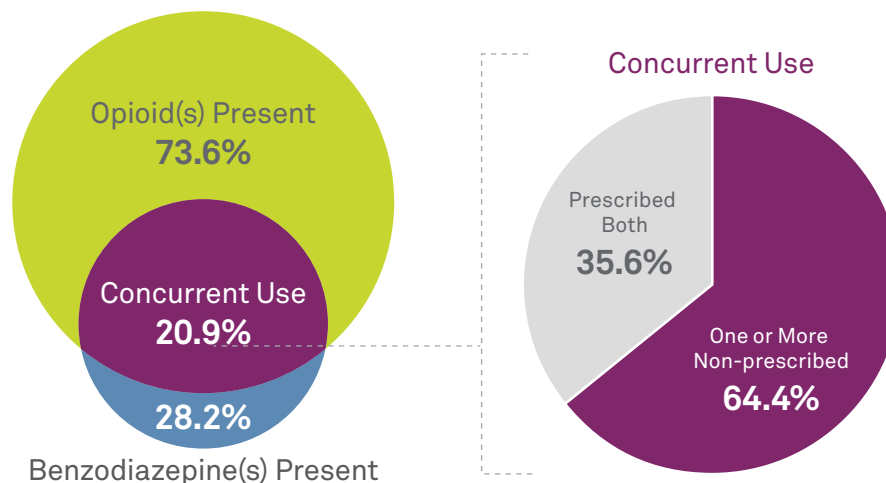
Both opioids and benzodiazepines depress the central nervous system. When combined, the dangers are magnified and can cause respiratory suppression, cardiac distress and even death.

In August 2016 the United States Food and Drug Administration (FDA) issued a "Boxed Warning" on both prescription opioids and benzodiazepines alerting prescribers to the dangers of concurrent use.

Despite these warnings, Quest data highlights that **over one in five** (20 percent) **test results showed potentially dangerous concurrent use of opioids and benzodiazepines** in 2017. In **nearly two-thirds** of these cases (64 percent), **at least one of the drugs was not prescribed**. Patients who were older and in Medicare were at heightened risk. These findings were presented at PAINWeek, a national conference held September 2018 in Las Vegas.

In 2015,
30%
of opioid-related
overdoses
involved
benzodiazepines.⁶

Sets of Test Results with Concurrent Use and Types of Concurrent Use



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Finding 4: Gabapentin misuse is on the rise

Approved by the FDA for use in 1993, gabapentin is often prescribed to treat seizures and neuropathic pain as well as certain psychiatric conditions. As access to opioids has been curtailed, gabapentin prescribing has increased. In 2017, gabapentin was the 10th most commonly prescribed medication in the United States: **68 million gabapentin prescriptions were dispensed**, up from 44 million in 2013.⁸

In 2017, 9.5 percent of patients tested by Quest for the drug showed evidence of non-prescribed gabapentin. Among patients in substance use disorder treatment settings, **misuse surged to almost 800 percent**, the most dramatic increase of any of the drug classes tracked by Quest. In this population, 8.0 percent of patients misused gabapentin, compared to 9.6 percent of patients in general care settings.

While the medication is generally not addictive in itself, gabapentin can exaggerate the effects of opioids. Individuals taking prescription opioids and gabapentin concomitantly have a 49 percent greater risk for opioid-related death than those treated with opioids only.⁹

10th

most commonly prescribed medication in the United States

9.5%

of 2017 test results with non-prescribed gabapentin

49%

have a greater risk for opioid-related death than those treated with opioids only

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Implications for Prescription Drug Monitoring Programs

Prescription drug monitoring programs (PDMPs) are state-run databases used to track prescriptions and dispensing of controlled prescription drugs, including opioids.⁷ PDMPs provide valuable information for curtailing inappropriate drug use. However, as the drug epidemic evolves to include more illicit drugs and drug combining, additional data from sources like clinical drug monitoring can provide insights for understanding the changing epidemic. For example, in the case of opioids and benzodiazepines, analysis of prescribing data suggests the rate of combinations of these two drugs is less than 10 percent – half the rate cited by Quest’s objective laboratory data.¹⁰

Treating Pain

Drug Monitoring Can Aid Appropriate Use of Medications to Treat Chronic Pain

Given the scope of the nation’s opioid-fueled drug epidemic, it can be easy to overlook that for many people, prescription opioids are a source of pain relief. About 25 million Americans live with daily chronic pain, according to the National Institutes of Health (NIH).

CDC Recommends Lab Testing for Long-Term Opioid Use

Opioid prescription and management guidelines issued by the Centers for Disease Control and Prevention (CDC) in 2016 include use of urine drug testing before starting opioid therapy, and consideration of urine drug testing at least annually to assess for prescribed medications as well as other controlled prescription drugs and illicit substances.¹¹

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The objectives of this study were to assess the scope and demographic drivers of clinical drug misuse in America based on analysis of clinical drug monitoring ordered by physicians through our laboratories. We examined the association of age, gender, payer type and geography on inconsistency rates. All patients were tested using our proprietary prescription drug monitoring service and medMATCH® reporting methodology for tests of commonly prescribed and abused drugs, including pain medications, central nervous system medications and amphetamines, as well as certain illicit drugs such as marijuana and cocaine.

Effective February 2015, the number of drugs included in our analysis increased from 26 to 44 as we supplemented testing data of profile-based drug panels with individual drug tests. Our medMATCH reports indicate whether the prescribed drug(s), as specified by the ordering provider, or other drugs are detected in a specimen. Drug testing may include presumptive immunoassay screens as well as definitive mass spectrometry quantitative analyses and confirmations of presumptive positive results. Mass spectrometry is the most sensitive and specific drug testing method.

Our study's strengths include its size, geographic scope, multiple years of test results and its use of validated testing by the highly reliable mass spectrometry method. Its limitations include the geographic

disparities and the inability to validate or contextualize test results with medical records. Like any laboratory test, a clinical determination is made by a physician, according to several factors. Laboratory testing does not identify substance use disorders or impairment due to drug use. Patient variations, such as hydration state and drug metabolism, as well as methodology limitations, can contribute to a failure to detect drugs in a small minority of specimens.

Moreover, it is possible that in some cases, patients in our study were referred to testing because their healthcare providers suspected a high probability of misuse, while the index of suspicion was lower for others who were not tested. In addition, some healthcare providers may have neglected to indicate all prescribed drugs a patient was taking when submitting the test request. The population of patients may have shifted over time. "Medical" and "recreational" use of marijuana was determined based on information about the medication regimen provided by the patients' physicians. Current drug monitoring does not track synthetic (illicit) forms of fentanyl.

Quest Diagnostics Health Trends studies are performed on aggregate de-identified data in compliance with applicable privacy regulations and the company's strict privacy policies, and follow procedures approved by the Western Institutional Review Board.

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About Quest Diagnostics Health Trends™

Quest Diagnostics manages the largest database of de-identified clinical laboratory data, based on 44 billion laboratory test results. As part of the company's commitment to empowering better health, the company shares clinically significant insights in Quest Diagnostics Health Trends studies that empower patients, healthcare practitioners and policymakers to take actions leading to better health.

Quest Diagnostics Health Trends studies are developed in collaboration with top researchers and institutions. They are published in peer-reviewed medical journals, at scientific conferences and made available to the public online. These reports have yielded novel insights to aid the management of allergies and asthma, clinical drug misuse, chronic kidney disease, diabetes, heart disease, influenza and wellness.

The company also produces the Drug Testing Index (DTI)™, a series of reports on national workplace drug positivity trends.

While a team of medical, data and communication experts contributed to this report, its primary authors include F. Leland McClure, Ph.D., M.Sci., F-ABFT; Jeffrey Gudin, M.D.; Harvey W. Kaufman, M.D.; and Justin K. Niles, M.A.

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